

## Resolution of the *Prasophyllum alpinum* R.Br. (Orchidaceae) complex in mainland south-eastern Australia, Tasmania and New Zealand

David L. Jones

Centre for Plant Biodiversity Research, G.P.O. Box 1600, Canberra, 2601, Australian Capital Territory, Australia.

### ABSTRACT

An account is presented of the *Prasophyllum alpinum* complex in subalpine regions of south-eastern Australia, Tasmania and New Zealand. Four species are recognised; *Prasophyllum sphacelatum* is described as new, *P. tadgellianum*, found to be the common species from south-eastern Australia, is reinstated from synonymy, *P. alpinum sensu stricto*, is a narrow endemic restricted to central and southern Tasmania and *P. colensoi* is endemic to New Zealand. All species are illustrated and a key to the complex is provided.

### Introduction

The moist, grassy woodlands and herbfields of subalpine areas in mainland south-eastern Australia, Tasmania and New Zealand provide suitable growing conditions for species of *Prasophyllum*. Two groups are prominent, the species of one group having a conspicuous white labellum with an inconspicuous callus (represented by *P. suttonii* R.S.Rogers & B.Rees), those of the other group having flowers which are dull greenish or brownish and have a prominent, raised labellum callus. For the latter group the name *Prasophyllum alpinum* R.Br. has been commonly interpreted as applicable to all specimens/entities in south-eastern Australia and Tasmania (Rupp 1943, Firth 1965, Gray 1966, Nicholls 1969, Burbidge & Gray 1970, Willis 1970, Clements 1989, Curtis 1979, Jones 1988, Bernhardt & Rowe 1993), with *P. tadgellianum* R.S.Rogers being treated as its synonym. Bates (1994) noted that mainland populations differed from *P. alpinum* in being outcrossing and having larger flowers and 'if these are considered distinct at species level, the name *P. tadgellianum* applies to them'. *Prasophyllum colensoi* J.D.Hook. from similar subalpine areas in New Zealand (Moorc & Edgar 1970, Johns & Molloy 1983) has long been recognised as a New Zealand counterpart of *P. alpinum*.

Field collections over several years by the author in subalpine regions of south-eastern New South Wales and north-eastern Victoria have established the existence of two separate taxa in mainland Australia. Examination of photographs of the types of *P. alpinum* (fide M. Clements) and *P. colensoi* (fide B. Molloy), has clearly shown that neither of these taxa is present on the Australian mainland. Dissection of fresh material from Mount Wellington, Tasmania (the type locality of *P. alpinum*) and of spirit material of *P. colensoi* from New Zealand has confirmed these findings. Examination of the type specimens of *P. tadgellianum* shows it to be the widespread mainland taxon. Accordingly the *Prasophyllum alpinum* complex consists of four taxa, viz. *P. alpinum* (here reinterpreted *sensu stricto*), *P. tadgellianum* (here reinstated), *P. colensoi* and *P. sphacelatum*, here described as new.

### Methods

This study is based on the morphological examination of fresh flowers collected from localities in south-eastern mainland Australia and Tasmania and field observations and herbarium collections (spirit and dried) from the following herbaria (AD, CHR, CANB, HO and MEL.). Type specimens or photographs of types of all pertinent described taxa have been examined including those in overseas herbaria (BM, K, K-L). Measurements

given in descriptions are from living plants or spirit-preserved specimens. Notes on distribution, habitat (particularly soil and plant associations) and conservation status of the Australian species were derived from my own field studies; those of *P. colensoi* from discussion with Brian Molloy, references and herbarium labels.

### Taxonomic history

The first species recognised within the complex was *P. alpinum* described by Brown in 1810. Brown's specimens were collected from the top of Table Mountain (now Mount Wellington), Hobart, Tasmania (Brown 1810, Clements 1989). *Prasophyllum colensoi* was described by Hooker in 1853 from material collected in New Zealand. The next taxon to be described was *P. frenclii* var. *tadgellianum* by Rogers in 1922 from specimens collected on Mount Hotham in north-eastern Victoria at an altitude of 5,100 ft. He redescribed this taxon at specific rank about one year later based on specimens collected on Mount Bogong, north-eastern Victoria at an altitude of 6,500 ft. Almost from the time of its description, this latter taxon has been treated as a synonym of *P. alpinum* (Nicholls 1934, Rupp 1943), although some authors have regarded *P. tadgellianum* as a valid species (Pescott 1928, Ewart 1930).

### Taxonomic treatment

#### KEY TO SPECIES OF THE *PRASOPHYLLUM ALPINUM* COMPLEX

- 1 Flowers 5.5-7 mm long, labellum ovate, erect in distal quarter, column wings about half as long as the anther ..... **1. *Prasophyllum alpinum***
- 1: Flowers 10 mm or more long, labellum ovate-lanceolate, erect in distal half, column wings as long as or longer than the anther ..... **2**
- 2 Flowers 14-18 mm long ..... **4. *Prasophyllum sphecelatum***
- 2: Flowers 10-12 mm long ..... **3**
- 3 Labellum conspicuously stalked at the base, lateral sepals free throughout or connate at the very base ..... **2. *Prasophyllum colensoi***
- 3: Labellum shortly stalked or subsessile at the base, lateral sepals connate except at the tip ..... **3. *Prasophyllum tadgellianum***

**1. *Prasophyllum alpinum*** R.Br., *Prodr.* 318 (1810). *P. fuscum* R.Br. var. *alpinum* (R. Br.) C. Moore & Betche, *Handb. Fl. NSW* 396 (1893). TYPE: Top of Table Mountain near Derwent River, Tasmania, *R. Brown s.n.* (LECTOTYPE: BM photo; *vide* M. Clements 1989).

*Solitary terrestrial tuberous herb* 6-20 cm tall. *Tubers* not seen. *Leaf* 8-20 cm long, 2-5 mm across at the widest, dark green, base white, free lamina 8-12 cm long, erect, slender, moderately stiff, longer than inflorescence. *Raceme* 3-10 cm long, bearing 5-14 subsessile, well-spaced flowers. *Floral bracts* ovate, c. 1.6 mm long, c. 2 mm wide, closely sheathing, subacute to obtuse or emarginate. *Ovary* obpyriform to obovoid, c. 5 mm long, c. 2.5 mm wide, set at about 35° to the rachis. *Flowers* 5.5-7.5 mm long, green to greenish brown, no scent apparent, some flowers opening freely, often others remaining closed. *Dorsal sepal* ovate to elliptical, 4-5 mm long, 2-2.2 mm wide, decurved, subacute to obtuse, distal margins involute. *Lateral sepals* connate, straight or slightly recurved in distal half, involute near the apex. *Petals* linear-lanceolate, 3.5-4 mm long, c. 1 mm wide, obliquely erect, often overlapped by the margins of the lateral sepals. *Labellum* more or less ovate to broadly ovate-lanceolate in outline when flattened, 3-4 mm long, 2-2.3 mm wide, distinctly clawed, whitish to greenish, proximal third erect, the margins entire to slightly folded; callus occupying about two-thirds of the ventral surface of the lamina and of similar shape, raised, very thick, green, shiny, smooth, extending nearly to the labellum apex. *Column* prorect from the end of the ovary, c. 2 mm long, c. 1.5 mm wide; appendages narrowly linear, much shorter than the

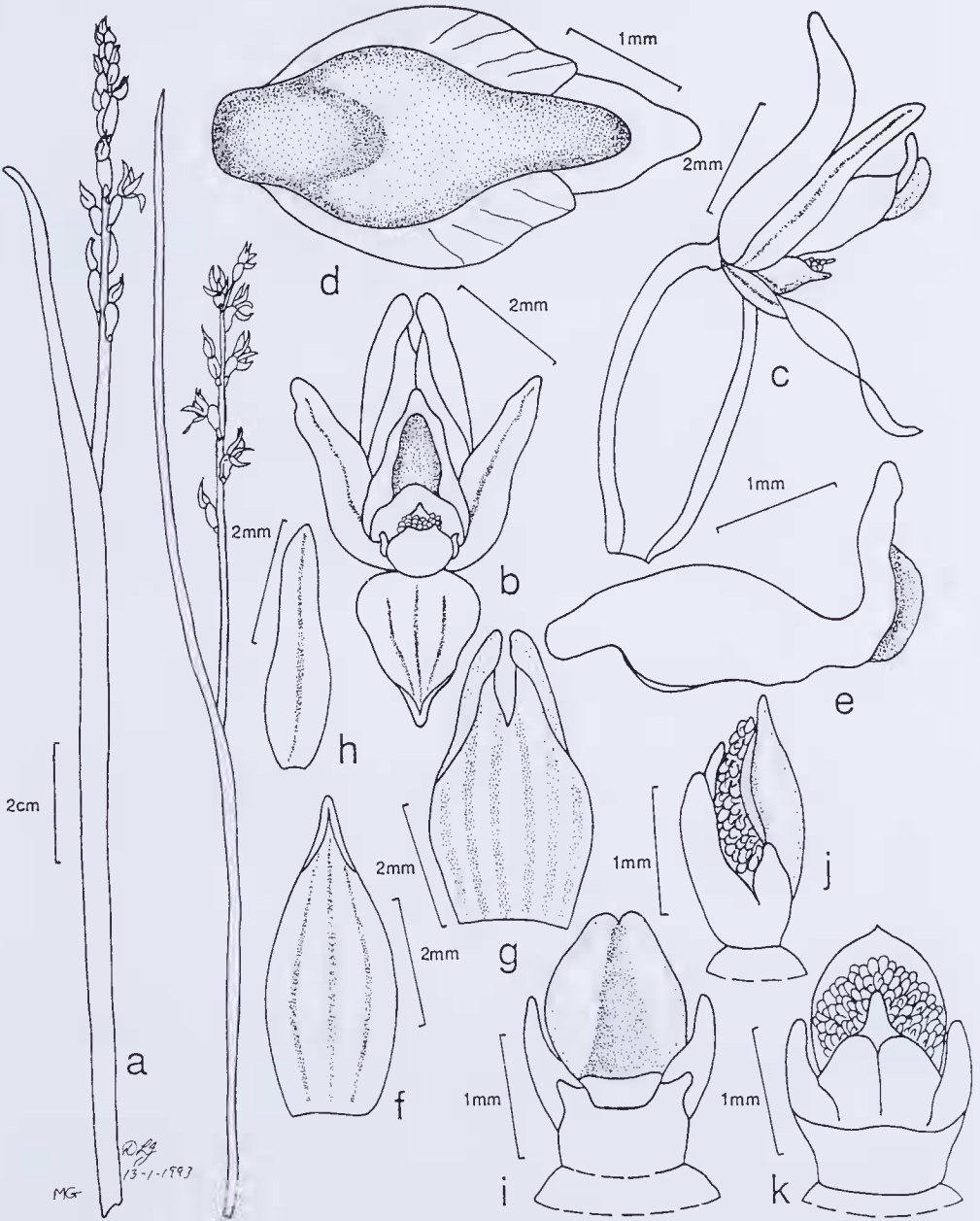


Fig. 1. *Prasophyllum alpinum* R.Br. a - plant habit. b - flower from front. c - flower from side. d - labellum from above, flattened out. e - labellum from side. f - dorsal sepal flattened out. g - conjoined lateral sepals. h - petal. i - column from rear. j - column from side. k - column from front. All drawn from *H. Wapstra* (Jones 11177, CBG).

anther, obtuse, c. 1.4 mm long, 0.3 mm wide, with connate basal lobes c. 0.4 mm long. *Anther* ovate, c. 1.3 mm long, 1.1 mm wide, green to greenish brown, smooth to rugulose; rostrum short, obtuse. *Pollinarium* c. 1 mm long, degenerate; viscidium absent or vestigial; hamulus absent or vestigial; pollinia c. 1 mm long, pale yellow, sectile. *Stigma* reniform, c. 1 mm long, c. 0.7 mm wide, the rostellum about as high as the appendages. *Capsules* obovoid, c. 6 mm long, 3 mm wide, green, shiny. (Fig. 1)

#### FLOWERING PERIOD

December to February.

#### DISTRIBUTION AND HABITAT

Endemic to Tasmania where common on southern peaks above 650 m. altitude, extending north to about Cradle Mountain. Grows in subalpine herbfield, sedge-land and in moist grassy areas among *Eucalyptus coccifera* J.D.Hook.; occasionally in feldmark. Sometimes plants are found growing in the cushions of *Abrotanella forsterioides* (J.D.Hook.) Benth.

#### NOTES

*Prasophyllum alpinum* is a very distinctive species which can be distinguished from all other species in the complex by its small (5.5-7.5 mm long), green to greenish brown, apparently scentless flowers. In addition the labellum is ovate rather than ovate-lanceolate as in the other subalpine taxa, with the distal third erect (distal half in other taxa). The column is very distinctive, being dominated by the anther and with very short column wings. The flowers of this species generally open freely but in some localities cleistogamous variants occur, these plants having excessively swollen ovaries at anthesis. Occasional plants may also have racemes of cleistogamous flowers mixed with open flowers.

#### CONSERVATION STATUS

Widely distributed, locally common and conserved in National Parks.

#### SELECTED SPECIMENS (24 examined)

TASMANIA: south ridge of Dome Hill, Eldon Range, 6 Feb. 1987, *Buchanan* (HO); slopes of Mt Wellington, no date, *Chisholm*, *Herb. W.H.Nicholls* (MEL); track to Lake Belcher, Mt Field National Park, 2 Feb. 1969, *Canning 2294* (CBG); Mt Barrow, 13 Feb. 1969, *Canning 2646* (CBG); Ben Nevis, 18 Feb. 1986, *Collier 1294* (HO); Mt Sedgewick, 27 Dec. 1987, *Collier 3055* (HO); Collinsvale Track, Mt Wellington, 7 Feb. 1947, *Curtis* (HO); Lake Thor, Walls of Jerusalem, 21 Jan. 1983, *Moscal 1457* (HO); Cradle Mtn, no date, *Sutton*, *Herb W.H.Nicholls* (MEL).

**2. *Prasophyllum colensoi*** J.D.Hook., *Fl. N.Z.* 1:241-2 (1853). TYPE: Northern and Middle Islands, common. East coast and interior, *W. Colenso*; Canterbury, *D. Lyall*. (SYNTYPES: K, photo; *vide* M. Clements).

*Prasophyllum pauciflorum* Colenso, *Trans. & Proc. New Zealand Inst.* 18: 273 (1886). TYPE: Hills, country west of Napier; 1883, *W. Colenso* (HOLOTYPE: not found) - *P. colensoi* is common in this locality (*B. Molloy pers. comm.*).

Illustrations: T.F. Cheeseman (ed.), *Illustrations of the New Zealand Flora*, vol. 2, fig. 193 (1914); J.T. Salmon, *New Zealand Flowers and Plants in Colour*, plate 479 (1963); L.B. Moore and E. Edgar, *Flora of New Zealand*, vol. 2, fig. 30 (1970); L.B. Moore & J.B. Irwin, *The Oxford Book of New Zealand Plants* 194, fig. 2 (1978); J. Johns and B. Molloy, *Native Orchids of New Zealand*, plate 78 (1983).

*Solitary terrestrial tuberous herb* 10-30 cm tall. *Tubers* not seen. *Leaf* 12-35 cm long, 2-5 mm across at the widest, dark green, base white, free lamina 8-12 cm long, erect, slender, moderately stiff, longer than inflorescence, often partially withered at anthesis. *Raceme* 3-12 cm long, bearing 5-20 (rarely more), subsessile, moderately crowded flowers. *Floral bracts* ovate c. 1.6 mm long, c. 2 mm wide, closely sheathing, subacute

to obtuse or emarginate. *Ovary* obpyriform to obovoid, c. 4 mm long, 2.3 mm wide, set at about 40° to the rachis. *Flowers* 10-11 mm long, yellowish-green to reddish-brown, lightly scented, opening freely. *Dorsal sepal* ovate to elliptic-ovate, 6-7 mm long, 2-2.4 mm wide, decurved, obtuse to apiculate, distal margins involute. *Lateral sepals* linear-lanceolate, 6-7 mm long, 1.7-2 mm wide, free or connate at the base, recurved in distal half, parallel to slightly divergent, involute near the apex, bidentate. *Petals* oblong-lanceolate to linear-lanceolate, 6-7 mm long, c. 1.5 mm wide, porrect, decurved. *Labellum* ovate-lanceolate in outline when flattened, 6-7.5 mm long, 4-4.5 mm wide, conspicuously stalked, greenish to reddish-brown, proximal half erect or recurved, the tip often protruding between the lateral sepals, the margins entire or slightly undulate; callus occupying about two-thirds of the ventral surface of the lamina and of similar shape, raised, very thick and fleshy, green to red, shiny, wrinkled near the apex, extending nearly to the labellum apex. *Column* porrect from the end of the ovary, c. 2 mm long, c. 2 mm wide; appendages narrowly linear, falcate, longer than the anther, obtuse, c. 1.5 mm long, 0.4 mm wide, with connate basal lobes c. 0.4 mm long. *Anther* ovate, c. 1.5 mm long, 1.3 mm wide, brown, smooth to rugulose, much shorter than the rostellum; rostrum short, obtuse. *Pollinarium* c. 1 mm long; viscidium c. 0.2 mm long, ovate, white; hamulus c. 0.3 mm long, ligulate; pollinia c. 0.9 mm long, linear-clavoid, yellow, sectile. *Stigma* reniform, c. 1.3 mm x 1 mm, the rostellum about as high as the appendages. *Capsule* obovoid, c. 6 mm long, 3 mm wide, green to red-brown, shiny. (Fig. 2)

## FLOWERING PERIOD

November to January

## DISTRIBUTION AND HABITAT

Endemic to New Zealand where widely distributed over the North and the South Island; in the North Island mainly occurring in mountainous regions south of the Central Volcanic Plateau, but distributed sporadically as far north as Towai (Moore & Edgar 1970); in the South Island occurring from sea level to about 1200 m. altitude. Grows in subalpine herbfield in tussock grassland and in moist areas around the margins of bogs.

## NOTES

*Prasophyllum colensoi sensu stricto* is similar morphologically to *P. tadgellianum* but can be distinguished by the more slender leaf, broader, lanceolate petals, the conspicuously stalked labellum, the lateral sepals being free throughout or connate only at the very base and the much more angular stigmatic plate which is longer than the anther. Bates (*pers. comm.*) maintains that detailed research into the great variation exhibited by *P. colensoi* may result in the recognition of further taxa. This notion may be supported by Hatch (1947), who records this species as having up to forty flowers when fewer than twenty are consistently reported in the literature.

## TYPIFICATION

This species will be lectotypified in a forthcoming publication (Molloy, Clements and Jones in prep.).

## CONSERVATION STATUS

Widely distributed, common and well conserved.

## SPECIMENS EXAMINED

NEW ZEALAND: Canterbury, no date, *Haast* (MEL); Roto Itu, no date, *Kirk* (MEL); New Zealand, no date, *Travers* (MEL); Bryant Ra., Nelson, 27 Dec. 1990, *Jenks* (CHR); Puffer Tk, Wellington, 13 Dec. 1990, *Molloy* (CHR); Windy Point, Canterbury, 13 Nov. 1990, *Molloy* (CHR); Ahuriri, Pont Hills, Canterbury, 17 Dec. 1990, *Molloy* (CHR); Dunedin, Otago, 24 Dec. 1990, *St. George* (CHR); Mt Herbert, Canterbury, 3 Jan. 1991, *Molloy* (CHR); Lake Lyndon, Canterbury, 4 Jan. 1991, *Molloy* (CHR).

**3. *Prasophyllum tadgellianum*** R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 47:338-339 (1923). TYPE: Victoria, Mount Bogong, 7 Feb. 1923, *A.J. Tadgell in herb.*

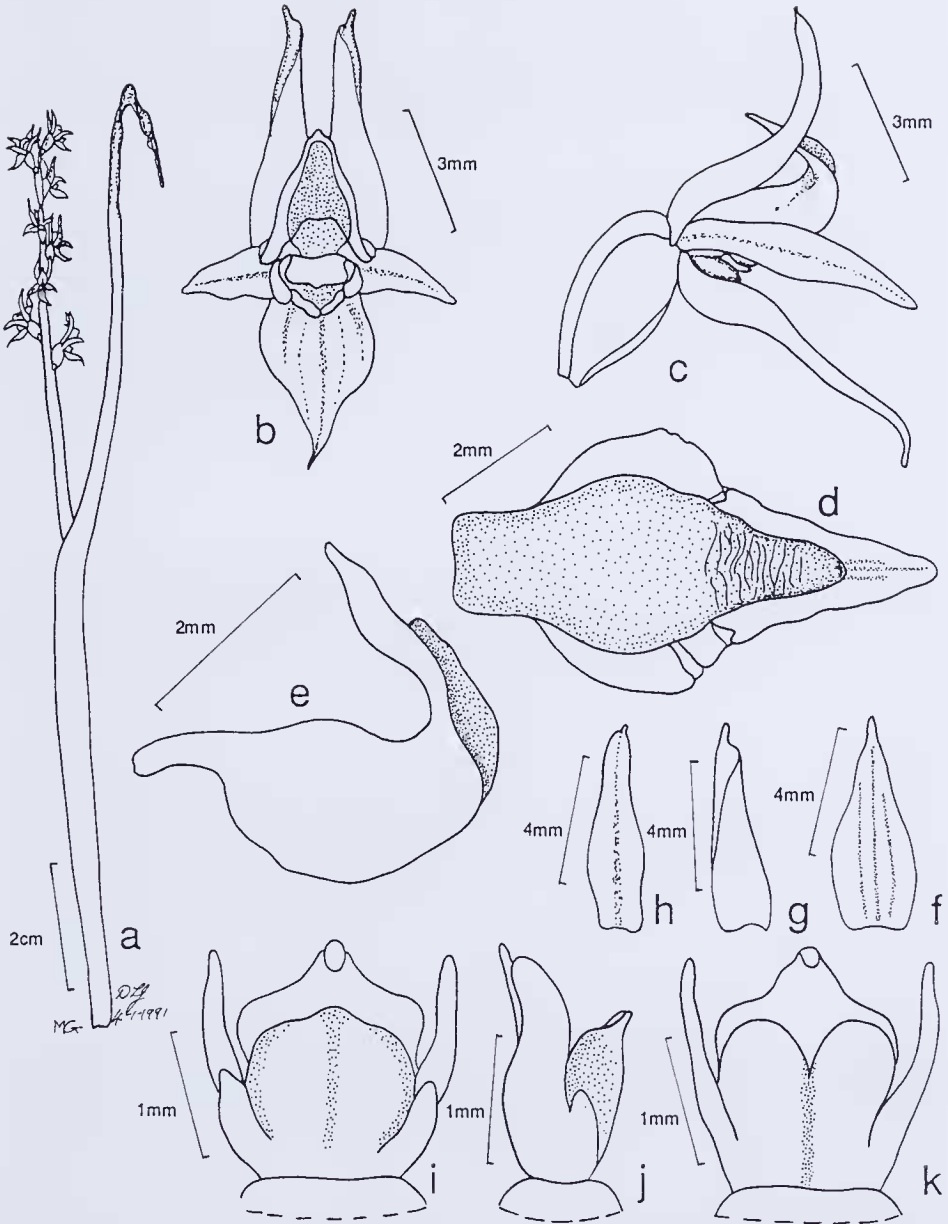


Fig. 2. *Prasophyllum colensoi* J.D.Hook. a - plant habit. b - flower from front. c - flower from side. d - labellum from above, flattened out. e - labellum from side. f - dorsal sepal flattened out. g - conjoined lateral sepals. h - petal. i - column from rear. j - column from side. k - column from front. All drawn from *Lyden s.n.* (CBG).

*R.S. Rogers 2954a* (LECTOTYPE: AD; *vide* Clements 1989; ISOLECTOTYPE: BM, K, MEL).

*Prasophyllum frenchii* F. Muell. var. *tadgellianum* R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 46: 153-154 (1922). TYPE: Victoria, Mount Hotham, 4 Dec. 1914, *A.J. Tadgell in herb.* R.S. Rogers (LECTO: AD; *vide* Clements 1989).

Illustrations: (all as *Prasophyllum alpinum*) W.H. Nicholls, *Orchids of Australia*, complete ed., plate 138 (1969); C.E. Gray, *Victorian Native Orchids*, vol. 1, 78 (1966); N.T. Burbidge and M. Gray, *Flora of the A.C.T.*, fig. 111A (1970); A.B. Costin, M. Gray, C.J. Toterdell and D.J. Wimbush, *Kosciusko Alpine Flora*, plates 145 & 146 (1979).

*Solitary or tufting terrestrial tuberous herb* 10-22 cm tall. *Tubers* 6-8 mm across, ovoid, irregular. *Leaf* 10-20 cm long, 4-8 mm across at the widest point, dark green and shiny, base white to green, free lamina 4-8 cm long, moderately stiff, turgid erect or shallowly incurved or recurved. *Raceme* 5-8 cm long, the peduncle often enclosed by the leaf at anthesis, bearing 8-20 subsessile, crowded flowers. *Floral bracts* broadly ovate, c. 3 mm long, c. 3 mm wide, closely sheathing, subacute to apiculate. *Ovary* obpyriform, c. 4 mm long, c. 3 mm wide, set at about 35° to the rachis, the ribs darker. *Flowers* 10-12 mm long, dark greenish brown to dark reddish brown, lightly scented, the tepals spreading widely. *Dorsal sepal* ovate-lanceolate, 5.5-6.5 mm long, 2.3-2.6 mm long, with 3 brown striae, decurved, subacute. *Lateral sepals* connate except near the apex, obliquely erect, recurved in distal half, involute near the apex. *Petals* narrowly linear-lanceolate, 5-5.5 mm long, c. 1 mm wide, porrect or slightly decurved, usually incurved near the apex. *Labellum* more or less ovate-lanceolate in outline when flattened, margins suddenly incurved near the middle, 4.3-4.6 mm long, 2.5-2.8 mm wide, shortly stalked to subsessile, greenish, whitish or pinkish, proximal half erect to slightly recurved, the margins entire or slightly undulate; callus occupying most of the ventral surface of the lamina and of similar shape, raised, green, shiny, fleshy, smooth, extending nearly to the labellum apex. *Column* porrect from the end of the ovary, c. 1.5 mm long, c. 2 mm wide; appendages narrowly oblong, as high as the anther, obtuse, whitish, c. 1.5 mm long, 0.5 mm wide, with connate basal lobes c. 0.6 mm long. *Anther* ovate, c. 1.3 mm long, 1.5 mm wide, brownish to purplish, rugulose; rostrum short, obtuse. *Pollinarium* c. 1 mm long; viscidium c. 0.2 mm long, oblong, white; hamulus c. 0.2 mm long, ligulate; pollinia c. 0.9 mm long, linear-clavoid, yellow, sectile. *Stigma* reniform, c. 1.3 mm long, 0.8 mm wide, the rostellum about as high as the appendages. *Capsule* obovoid c. 6.5 mm long, c. 4.5 mm wide, green with purplish ribs. (Fig. 3)

#### FLOWERING PERIOD

January to March

#### DISTRIBUTION AND HABITAT

South-eastern Australia, south from the Brindabella Ranges (A.C.T.) and Snowy Mountains in south-eastern New South Wales, Victoria (north-east and eastern highlands) and Tasmania (Cradle Mountain). Grows in subalpine herbfield, commonly in tussock grassland but also in seepage areas and around the margins of bogs and streams; occasionally among snow gums; rarely in feldmark.

#### NOTES

*Prasophyllum tadgellianum* has been commonly treated as a synonym of *P. alpinum* in the literature, but the two are morphologically distinct (see *P. alpinum* entry) and their ranges rarely overlap. *Prasophyllum tadgellianum* is more likely to be confused with *P. sphacelatum* since they are commonly sympatric. *Prasophyllum tadgellianum* can be distinguished from the latter species by its shorter, stouter habit (plants 10-22 cm tall), a moderately stout, stiff, turgid leaf lamina (hardly withered at anthesis), shorter racemes (5-8 cm long) with the flowers usually crowded and the perianth segments overlapping, smaller flowers (10-12 mm long), a smaller, nearly sessile labellum

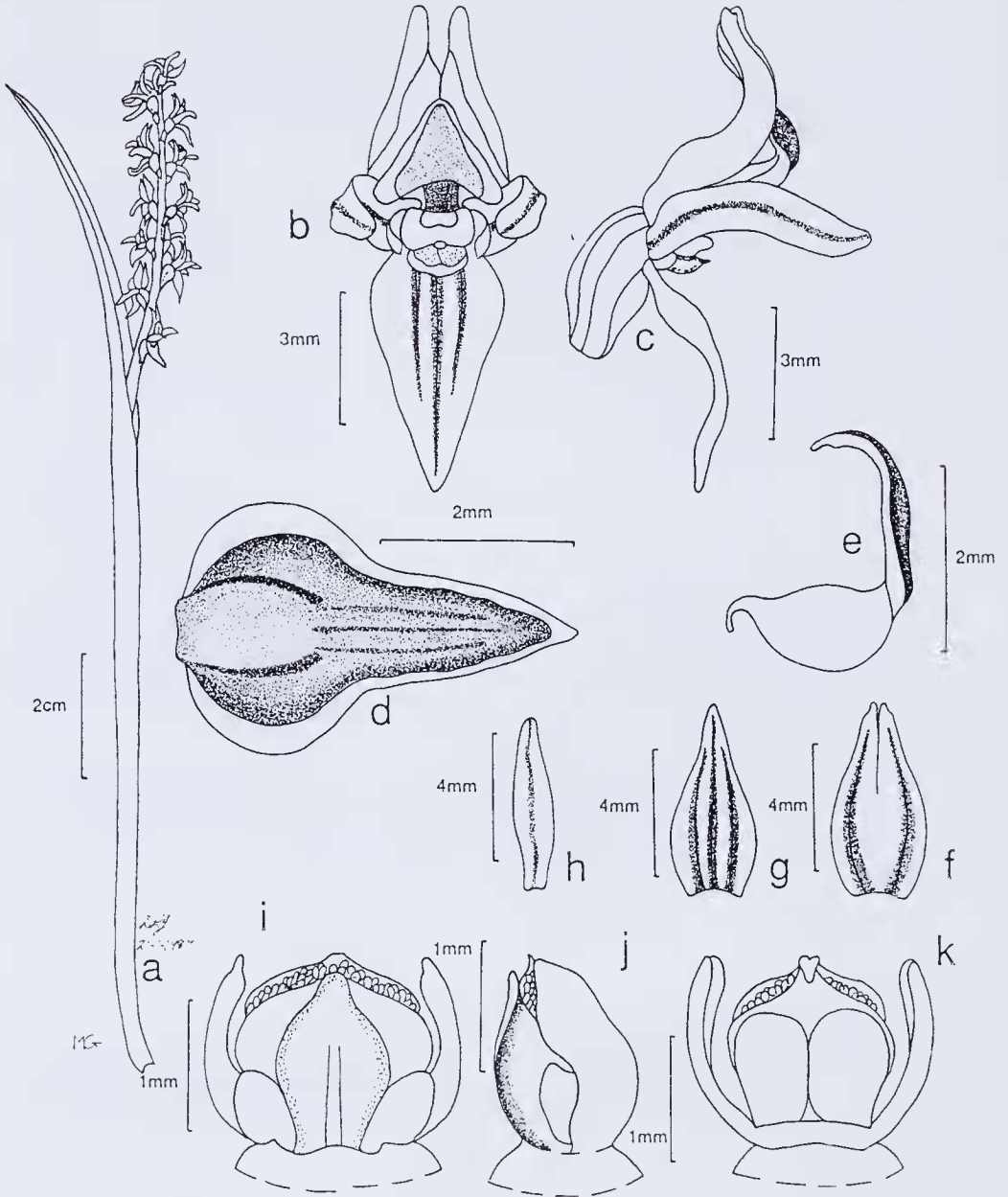


Fig. 3. *Prasophyllum tadgellianum* R.S.Rogers. a - plant habit. b - flower from front. c - flower from side. d - labellum from above, flattened out. e - labellum from side. f - dorsal sepal flattened out. g - conjoined lateral sepals. h - petal. i - column from rear. j - column from side. k - column from front. All drawn from Jones 3464 (CBG).



(4.3-4.6 mm x 2.5-2.8 mm), a thinner, more tapered lamina callus and a proportionately broader column (1.5 mm x 2 mm) with narrower column wings (0.5 mm wide). *Prasophyllum tadgellianum* tends to favour higher altitudes than *P. sphacelatum* (c. 1700 m to c. 2000 m alt.), growing mainly in subalpine and alpine meadows (rarely feldmark) and reaching its peak of flowering 2-3 weeks later than that species in areas where both grow sympatrically.

*Prasophyllum tadgellianum* is similar morphologically to *P. colensoi* but can be distinguished by the moderately stout, stiff, turgid leaf lamina (hardly withered at anthesis), narrower, linear-lanceolate petals, the nearly sessile labellum, the lateral sepals being connate throughout and the rounded stigmatic plate which is about as long as the anther.

#### CONSERVATION STATUS

Widespread, common and conserved in National Parks.

#### SELECTED SPECIMENS (84 examined)

NEW SOUTH WALES: Lake Albina, Kosciusko National Park, 10 Mar. 1969, *Pickard & Coveny 2725* (NSW, MEL); Mt Kosciusko, 16 Jan. 1953, *Gauba* (CANB); Mt Carruthers, Kosciusko National Park, 7 Feb. 1972, *Whitehead & Clemesha* (CBG).

VICTORIA: Wombargo Range, 11 Jan. 1971, *Beaglehole 35993* (MEL); Diggers Hole Ck. NW of Mt Nunniong, 22 Jan. 1971, *Beaglehole 36436 & E.W.Finck* (MEL); Cobberas No.1, 25 Jan. 1971, *Beaglehole 36487 & E.W.Finck* (MEL); summit of Mt Baw Baw, 12 Feb. 1965, *Jones* (MEL); Harrierville, Jan. 1932, *Mathews* (MEL); near Wilkinson's Memorial Hut, Bogong High Plains, 18 Jan. 1959, *Muir 662* (MEL); Mt Howitt, Dec. 1934, *Nicholls*, (MEL); Mt Buffalo, Dec. 1939, *Stewart* (MEL); Lankeys Plain, Dargo High Plains, 1 Jan. 1982, *Walsh 721*, (MEL).

TASMANIA: Fury Plains, c. 6 km before Waldheim, 24 Jan. 1974, *Allen* (HO); February Plains, 28 Jan. 1983, *Moscal 1547* (HO).

#### 4. *Prasophyllum sphacelatum* D.L.Jones, *sp. nov.*

affinis *Prasophyllum tadgelliano* R.S.Rogers a qua altiore, plerumque exiliore, lamina flaccida plerumque marcida, racemo floribus sparsioribus majoribusque, labello majore distincte unguiculato, callo crasso obtusiore, et columna alis latioribus proportione perangustiore differt.

TYPE: New South Wales; Southern Tablelands; c. 7 km along Tantangara Dam Rd. 3 Jan 1993, *D.L. Jones 11102* and *B.E. Jones* (HOLOTYPE: CANB; ISOTYPE: CANB, NSW, MEL, AD)

Illustrations: (all as *Prasophyllum alpinum*) E.R. Rotherham *et al.*, *Flowers and Plants of New South Wales and Southern Queensland*, plate 343 (1975); D.L. Jones, *Native Orchids of Australia*, 248 (1988).

*Solitary or tufting terrestrial tuberous herb* 20-38 cm tall. *Tubers* 8-12 mm across, ovoid, irregular. *Leaf* 28-38 cm long, 2-4 mm across at the widest, dull green, base white to reddish purple, free lamina 8-14 cm long, erect to flaccid, usually withered towards the apex. *Raceme* 8-14 cm long, bearing 6-18 subsessile, well-spaced to moderately crowded flowers. *Floral bracts* broadly ovate, c. 3 mm long, c. 3 mm wide, closely sheathing, subacute. *Ovary* obpyriform, c. 4 mm long, 3 mm wide, set at about 40° to the rachis. *Flowers* 14-18 mm long, green to reddish brown, strongly scented, the tepals spreading widely. *Dorsal sepal* ovate-lanceolate, 6.5-8 mm long, 3-4 mm wide, decurved, subacute, often with pale marginal bands. *Lateral sepals* ranging from completely free to completely connate, obliquely erect, straight or recurved in distal half, involute near the apex. *Petals* linear to narrowly linear-lanceolate, 6.5-7.5 mm long, 1-1.2 mm wide, obliquely erect to porrect, sometimes incurved near the apex. *Labellum* more or less ovate-lanceolate in outline when flattened, margins gradually incurved near the middle, 6-7.5 mm long, 3-3.5 mm wide, distinctly clawed, greenish to pinkish, proximal half erect to recurved, the margins undulate to slightly crisped; callus occupying most of the ventral surface of the lamina and of similar shape, raised, green, shiny,

smooth to wrinkled, extending nearly to the labellum apex. *Column* porrect from the end of the ovary, c. 2 mm long, c. 2 mm wide; appendages broadly obovate, as high as the anther, broadly obtuse to emarginate, c. 2 mm long, 0.7 mm wide, with connate basal lobes c. 1 mm long. *Anther* ovate, c. 1.7 mm long, 1.5 mm wide, brownish to purplish, rugulose; rostrum short, obtuse. *Pollinarium* c. 1.5 mm long; viscidium c. 0.25 mm long, oblong, white; hamulus c. 0.15 mm long, ligulate; pollinia c. 1.2 mm long, linear-clavoid, yellow, sectile. *Stigma* ± reniform, c. 1.2 mm long, c. 1 mm wide, the rostellum about as high as the appendages. *Capsule* obovoid, c. 8 mm long, c. 5 mm wide, green, shiny. (Fig. 4)

#### FLOWERING PERIOD

December to early February.

#### DISTRIBUTION AND HABITAT

South-eastern Australia, south from the Brindabella Ranges (A.C.T.) and Snowy Mountains in south-eastern New South Wales and eastern Victoria (north-east and eastern highlands). It grows in subalpine herbfield, often in tussock grassland, and in seepage areas as well as among grass and shrubs in snow gum (*Eucalyptus pauciflora* Sieber ex Sprengel) forest.

#### NOTES

*Prasophyllum sphacelatum* has been commonly confused in the literature with *P. alpinum* but the two species are morphologically distinct (see *P. alpinum* entry for its distinguishing features). The geographic ranges of the two do not overlap and *P. sphacelatum* is more likely to be confused in the field with *P. tadgellianum*, with which it is often sympatric. *Prasophyllum sphacelatum* can be distinguished from the latter species by its taller, more slender habit (plants 22-38 cm tall), an erect to flaccid leaf lamina which is usually withered towards the apex at flowering time, longer racemes (8-14 cm long) with the flowers sparse and the perianth segments hardly overlapping, larger flowers (14-18 mm long), a larger, distinctly stalked labellum (6-7.5 mm x 3-3.5 mm), a thicker, hardly tapered lamina callus and a proportionately narrower column (2 mm x 2 mm) with broader column wings (0.7 mm wide). *Prasophyllum sphacelatum* tends to favour lower elevations than *P. tadgellianum* (c. 1400 m to c. 1700 m alt.), grows among snow gums and in subalpine meadows and reaches its peak of flowering 2-3 weeks earlier than *P. tadgellianum* where the two species grow sympatrically.

#### CONSERVATION STATUS

Widespread, common and conserved in National Parks.

#### ETYMOLOGY

Derived from the Greek, *sphakelos*, necrosis, mortification, describing the withered leaf tip at anthesis.

#### SELECTED SPECIMENS (44 examined)

AUSTRALIAN CAPITAL TERRITORY: Murray's Gap, Bimberi Ra., 3 Jan. 1962, *Burbidge & Gray s.n.* (CANB); Mt Gingera, 10 Jan. 1963, *Gray s.n.* (CANB).

NEW SOUTH WALES: Rocky Gully Plains, Kiandra-Adaminaby Rd, 21 Dec. 1985, *Clements 3931* (CBG); Rules Point, 5 Jan. 1986, *Clements 3939* (CBG).

VICTORIA: source of Murray River, N of Cobberas, 5 Jan. 1992, *Bates* (AD, MEL); Rocky Plain, 6 Jan. 1971, *Beaulehole 35869 & Rogers* (MEL); Lake Hill, SW of Nunniong Plain, 20 Jan. 1971, *Beaulehole 36341 & Finck* (MEL); Bryees Plain, 10 miles [16 km] SE of Mt Hotham, 18 Jan. 1967, *Muir 4548* (MEL); upper western slopes of Mt Cobberas No.1, 25 Jan. 1970, *Muir 4819* (MEL); near Howitt Hut, Dec. 1934, *Nicholls s.n.* (MEL).

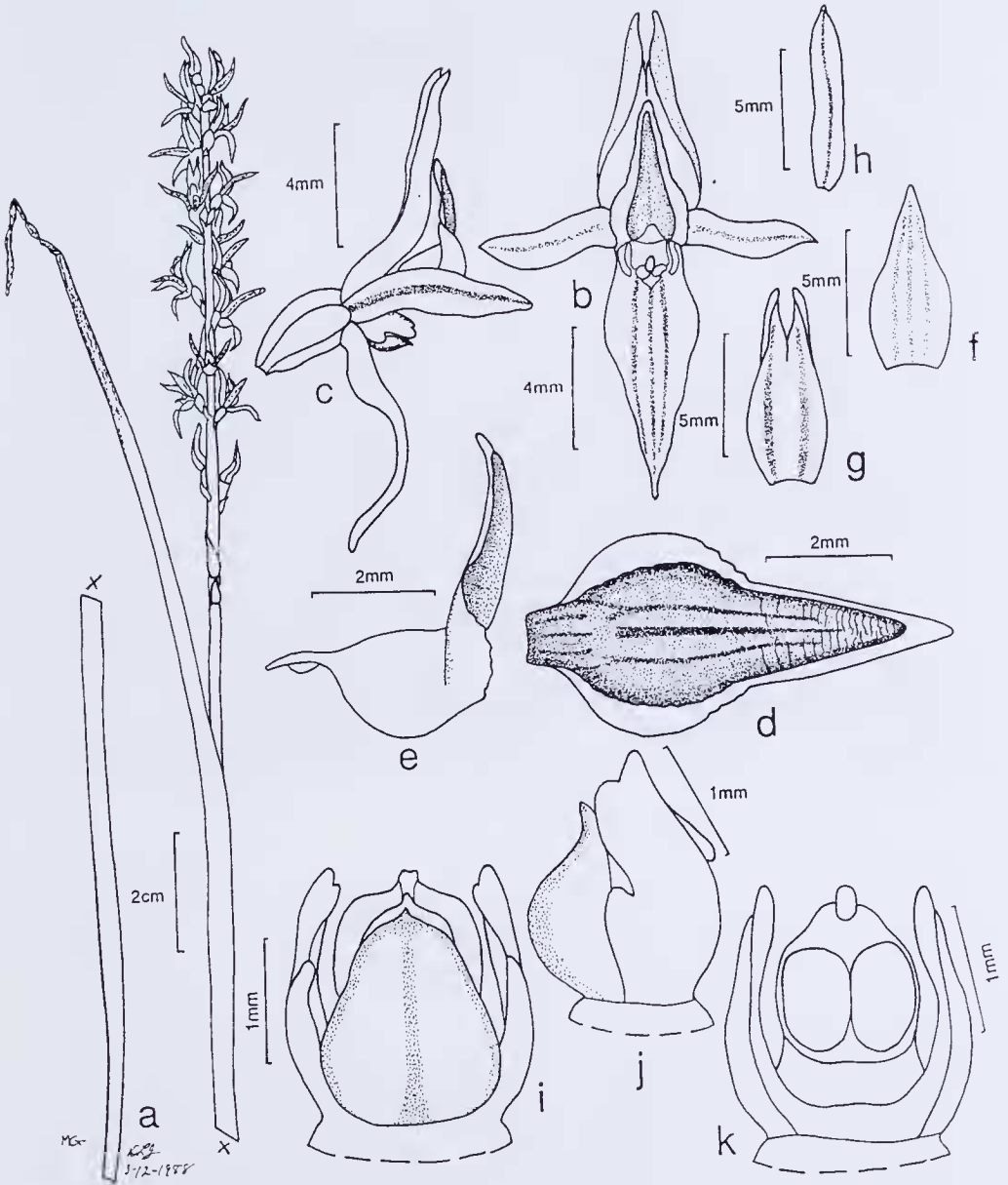


Fig. 4. *Prasophyllum sphacelatum* D.L. Jones. a - plant habit. b - flower from front. c - flower from side. d - labellum from above, flattened out. e - labellum from side. f - dorsal sepal flattened out. g - conjoined lateral sepals. h - petal. i - column from rear. j - column from side. k - column from front. All drawn from Jones 3441 (CBG).

### Acknowledgements

I thank David Ziegeler and Hans and Annie Wapstra for collecting specimens of *Prasophyllum alpinum* from Mount Wellington and Brian Molloy for supplying material of *P. colensoi*. Specimens were also supplied by Les Rubenach, Ross Smith, Peter Branwhite, Paul Barnett and Geoff Beilby. Corinna Broers and Barbara Jones provided valuable technical assistance throughout the project. Marion Garratt is thanked for her assistance in preparing the illustrations from my sketches. Lyn Craven prepared the Latin diagnosis and Mark Clements, Mike Crisp and Bob Bates commented on the manuscript. The Directors of the Australian Orchid Foundation are thanked for their support of field operatives. I also express my thanks to the directors of the herbaria AD, CHR, HO, MEL for the loan of specimens.

### References

- Bates, R.J. (1994). In N.G. Walsh & T.J. Entwisle (eds). *Flora of Victoria*. Vol. 2: (Inkata Press: Melbourne.) p. 881.
- Bernhardt, P. & Rowe, R.R. (1993). In G.J. Harden ed. *Flora of New South Wales*. Vol. 4: 160.
- Brown, R. (1810). *Prodromus florae Novae Hollandiae et Insulae van-Diemen*. (J. Johnson & Co.: London.)
- Burbidge, N.T. & Gray, M. (1970). *Flora of the Australian Capital Territory*. (Australian National University Press: Canberra.) p. 114.
- Clements, M.A. (1989). Catalogue of Australian Orchidaceae. *Australian Orchid Research* 1: 1-160.
- Curtis, W.M. (1979). *The Student's Flora of Tasmania*. Part 4A. (Government Printer: Hobart.) p. 75.
- Ewart, A.J. (1930). *Flora of Victoria*, 314, Government Printer, Victoria, Australia.
- Firth, M.J. (1965). *Native Orchids of Tasmania*. (C.L. Richmond & Sons: Devonport.) p. 21.
- Gray, C.E. (1966). *Victorian Native Orchids*. Vol. 1. (Longmans: Australia.) p. 78.
- Hatch, E.D. (1947). The New Zealand forms of *Prasophyllum* R.Br., *Transactions of the Royal Society of New Zealand* 76: 289-93.
- Johns, J. & Molloy, B. (1983). *Native Orchids of New Zealand*. (A.H. & A.W. Reed: Wellington.) p. 54.
- Jones, D.L. (1988). *Native Orchids of Australia*. (Reed Books Pty Ltd: Sydney.) p. 248.
- Moore, L.B. & Edgar, E. (1970). *Flora of New Zealand*. Vol. 2. (Government Printer, Wellington.) p. 148.
- Nicholls, W.H. (1934). Three species of the genus *Prasophyllum* R.Br. *Proceedings of the Royal Society of Victoria*, new series 46: 31.
- Nicholls, W.H. (1969). *Orchids of Australia*. (Thomas Nelson: Melbourne.) p. 35.
- Pescott, E.E. (1928). *The Orchids of Victoria*. (Horticultural Press: Melbourne.) p. 32.
- Rupp, H.M.R. (1943). *The Orchids of New South Wales*. (Australian Medical Publishing Coy.: Sydney.) p. 28.
- Willis, J.H. (1970). *A Handbook to Plants in Victoria*. Vol. 1 (2nd edition). (Melbourne University Press: Carlton.)

Revised paper received 13 July 1995.